

Climate

Climate can be thought of as a measure of a region's average weather over a period of time. In defining a climate, the geography and size of the region must be taken into account. A micro-climate might involve a backyard in the city. A macroclimate might cover a group of states. When the entire earth is involved, it is a global climate. Several factors control large scale climates such as latitude (solar radiation intensity), distribution of land and water, pattern of prevailing winds, heat exchange by ocean currents, location of global high and low pressure regions, altitude and location of mountain barriers.

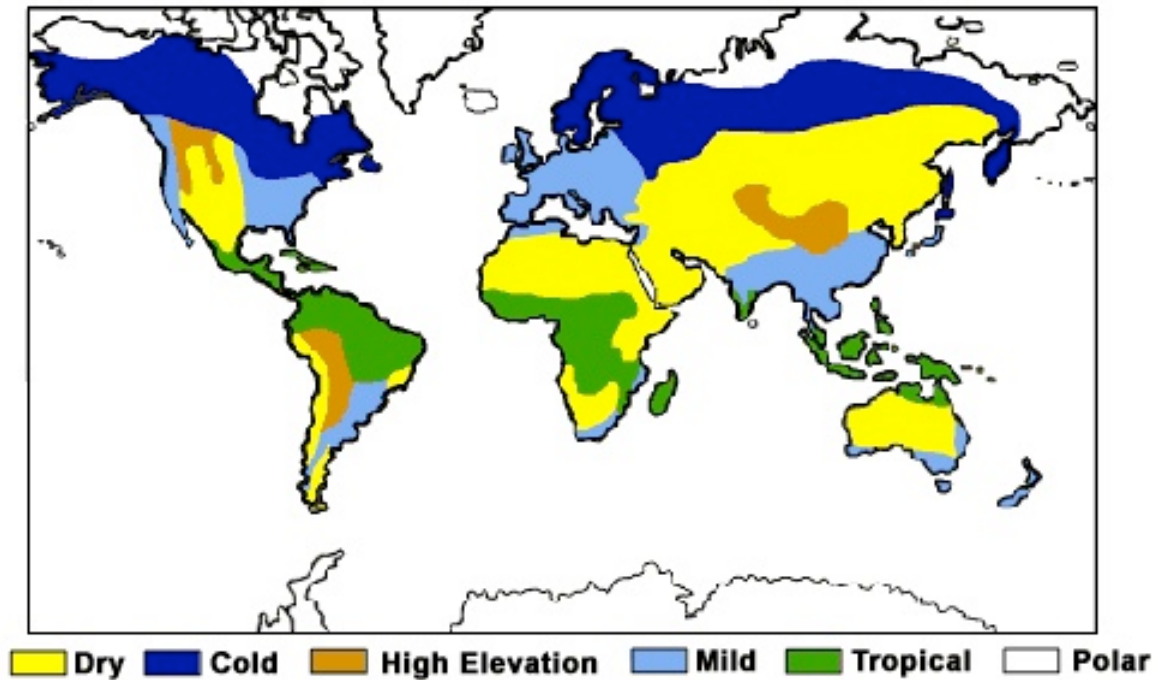
The most widely used scheme for classifying climate is the Köppen System. This scheme uses average annual and monthly temperature and precipitation to define five climate types:

1. tropical moist climates: average monthly temperature is always greater than 18°C
2. dry climates: deficient precipitation most of the year
3. moist mid-latitude climates with mild winters
4. moist mid-latitude climates with severe winters
5. polar climates: extremely cold winters and summers.

Using the Köppen system and the seasonal dominance of large scale air masses (e.g., maritime or continental), the earth's climate zones can be grouped as follows:

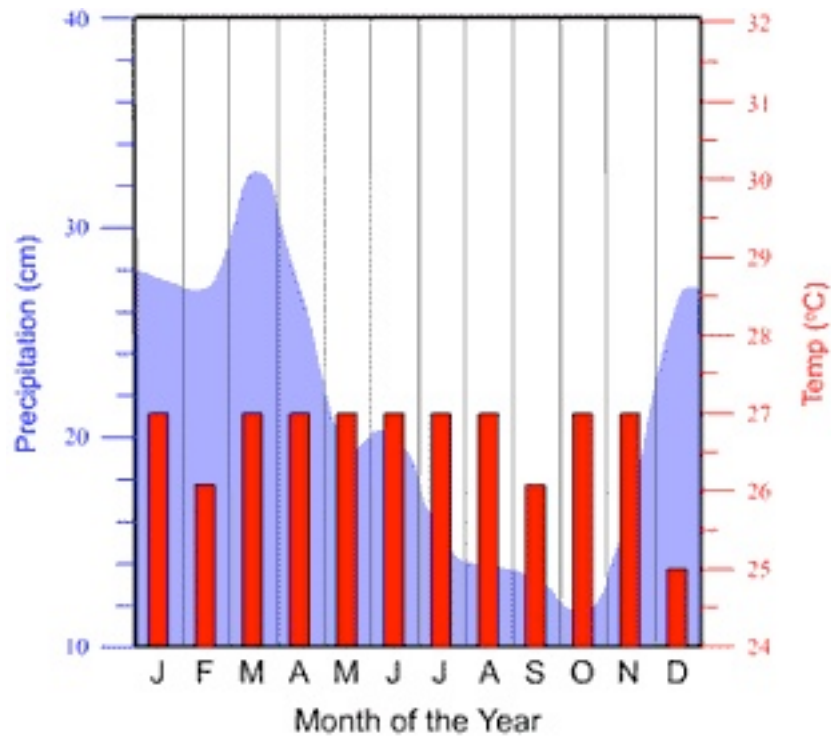
1. tropical wet
2. tropical wet and dry
3. tropical desert
4. mid-latitude wet
5. mid-latitude dry summer
6. mid-latitude dry winter
7. polar wet
8. dry and polar desert

Los Angeles has a mid-latitude dry summer climate, whereas New Orleans has a mid-latitude wet climate.



Data from natural climate records (e.g. ocean sediments, tree rings, Antarctic ice cores) show that the earth's climate constantly changed in the past, with alternating periods of colder and warmer climates. The most recent ice age ended only about 10,000 years ago.

The natural system controlling climate is very complex.



Yearly Climate Variations in a Rainforest

It consists of a large number of feedback mechanisms that involve processes and interactions within and between the atmosphere, biosphere and the solid earth.

Some of the natural causes of global climate change include plate tectonics (land mass and ocean current changes), volcanic activity (atmospheric dust and greenhouse gases), and long-term variations in the earth's orbit and the angle of its rotation axis (absolute and spatial variations in solar radiation).

More recently, anthropogenic (human) factors may be affecting the global climate. Since the late 19th century, the average temperature of the earth has increased about 0.3 to 0.6° C. Many scientists believe this global warming trend is the result of the increased release of greenhouse gases (e.g., CO₂) into the atmosphere from the combustion of fossil fuels.